2008) were used to determine the medicine treatment cost of 141 RA patients before and after treatment with biological drugs (namely infliximab, adalimumab and etanercept). [RSA Rand (R)/$US = 6.38112 (2005); 6.78812 (2006); 7.06926 (2007) and 8.27505 (2008)]. **RESULTS:** Biological drugs represented 81.43% of the total medicine treatment cost of RA patients (n = R25,432,294.04). Other medication (excluding biological drugs) prescribed to RA patients *before* starting with biological items represented 8.86% (n = R2 254 330.44) of their total medicine treatment cost; those prescribed *after* treatment with biological drugs, represented 3.91% (n = R992,533.62). The number of prescriptions for other medication (excl. biological drugs), decreased from the period *before* to the period *after* treatment with biological drugs from 6271 to 2120. The average number of the other medicine items (excl. biological) per prescription decreased from 2.79 ± 2.30 *before* to 2.35 ± 1.86 *after* treatment with biological drugs. The average cost per biological drug (R8 073.61 ± 2 210.46) was practically significantly (d > 0.8) higher than the average cost of other medication prescribed before (R128.45 ± 155.93) and *after* (R198.66 ± 888.31) treatment with biological drugs. **CONCLUSIONS:** Although biological drugs used in the treatment of RA are very expensive, it seems that the number of other medication prescribed to RA patients, as well as the average number of items per prescription decreased after treatment therewith. Further research is needed to investigate future medicine treatment cost of RA patients treated with biological drugs.

PMS31

THE IMPACT OF CHANGES IN ADALIMUMAB, ETANERCEPT, AND INFLIXIMAB DOSES ON THE COSTS OF TREATING RHEUMATOID ARTHRITIS

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OBJECTIVES: To review and analyze evidence on the changes in dose of adalimumab, etanercept and infliximab over time in adult patients with rheumatoid arthritis (RA) and the associated impact on treatment costs. **METHODS:** MEDLINE, EMBASE and NHS-EED were systematically searched to identify English language randomised controlled trials, cohort studies and observational studies published between January 1993 and December 2009. Conference abstracts were also hand searched from EULAR (2002 onwards) and ACR (2006 onwards). Studies were selected using predefined criteria, using two independent reviewers. Data pertaining to dose change were then analyzed through pair-wise, random effects meta-analyses carried out in a frequentist framework with heterogeneity assessed using the I^2 statistic. Associated cost data were extracted and the impact of change in dose on cost was investigated. **RESULTS:** Forty-five articles met the selection criteria with 23 containing dose change data and 26 containing cost data. a significantly greater proportion of patients on infliximab had a dose escalation compared to those on etanercept (odds ratio 0.17 95% CI 0.07, 0.43; $P < 0.001$) or adalimumab (odds ratio 0.25 95% CI 0.2, 0.3; $P < 0.001$). On average, 43.3% of infliximab patients, 7.3% of etanercept patients and 10.9% of adalimumab patients had their dose increased. RA related costs were on average 36% higher in patients who had their infliximab dose increased compared to 4% in patients on etanercept. No suitable data for adalimumab were available. **CONCLUSIONS:** A significantly greater proportion of infliximab patients required dose escalation compared to etanercept and adalimumab patients. There is some evidence to suggest that the escalation in dose required to maintain clinical benefit, results in substantially higher costs of treating RA.

PMS32

MICRO-COSTING ANALYSIS AND TARIFF COMPARISON: THE INTERSPINOUS PROCESS DEVICE CASE

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OBJECTIVES: In Italy the recent update of the DRG system has led to evaluate the effect on the diffusion of new therapies. The Interspinous Process Device (IPD) implantation represents an innovative strategy for different degenerative spinal pathologies with potential clinical and economic advantages. The aim of this study is to evaluate the hospitalization costs for IPD procedure according to a micro-costing approach and to compare it with current regional DRG tariffs. **METHODS:** The project, conducted from the hospital perspective, is performed in one pilot centre (Varese hospital), regional benchmark for this kind of procedure in which learning curve is considered completed. The cost analysis is based on the clinical pathway drawn up from the information provided by the medical team. Resource use including staff time, diagnostic tests, drugs, consumables and technology equipment utilization are collected from interviews to the team. Operating room costs, administrative and general costs and follow up hospital resource consumption are derived from hospital accounting data. Unit costs are collected either from hospital accounting or regional tariffs for specialist services. **RESULTS:** The total average cost estimated for a patient submitted to an IPD implantation is €5644, with an average LOS of 2.7 days. The average cost for the implantation of 1 IPD is €4515, value assigned to increase to €7087 for multilevel approaches with the implantation of 2 devices in the same procedure (42% of cases). Excluding general costs and the number of IPDs implanted, the main key cost driver are consumables and devices (62%), and operating room costs (16%). **CONCLUSIONS:** The regional tariff of the DRG related to this procedure (Lombardia Region, DRG 500, version 24) does not cover the hospitalization costs estimated, especially for the multilevel approaches. This leads to consider the effects of current reimbursement on the adoption of innovative therapy.

PMS33

COST-EFFECTIVENESS OF TOCILIZUMAB FOR THE MANAGEMENT OF PATIENTS WITH ACTIVE RHEUMATOID ARTHRITIS DESPITE PREVIOUS DMARD THERAPY IN MEXICO

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OBJECTIVES: Rheumatoid arthritis (RA) is a chronic, progressive, inflammatory disease that affects physical functioning and quality-of-life and is associated with premature mortality and substantial economic burden. We aimed to assess cost-effectiveness of tocilizumab added to disease-modifying antirheumatic drugs (DMARD) in patients with active RA despite DMARD therapy from the Mexican public health care system perspective. **METHODS:** Two models were designed to compare tocilizumab 8 mg/kg every 4 weeks; infliximab 3 mg/kg (weeks 0, 2, 6, 14 and 22); etanercept 25 mg twice a week and adalimumab 40 mg every other week. First model included only 6-month acquisition costs of drugs and infusion-related cost for infliximab and tocilizumab; the second was a Markov model with four states defined according to Disease Activity Score (DAS-28). Indirect comparison techniques were needed to adjust American College of Rheumatology (ACR) responses rates found in 10 clinical trials with biological agents. ACR70 at week 24 and overall days spent in remission during 5 years were main outcomes. Unit costs of medications were gathered from public bids; an expert panel was constituted to estimate 3-month resource use by health state. All costs are expressed in 2009 US dollars. **RESULTS:** First six-month costs were lower with tocilizumab (USD$4418) than with etanercept (USD$5,020), infliximab (USD$5484) and adalimumab (USD$5655). Adjusted ACR70 response rate was higher for tocilizumab than for anti-tumor necrosis factor (TNF) agents: 26% vs. 19%, 18% and 12% for adalimumab, etanercept and infliximab, respectively. Markov model estimates show savings of USD$623 up to USD$1321 per patient treated with tocilizumab instead of anti-TNF. Tocilizumab was also associated with mean gains of 9, 12 and 20 days in remission compared to etanercept, adalimumab and infliximab. **CONCLUSIONS:** When used instead of anti-TNF agents, add-on treatment with tocilizumab brings both health benefits and cost-savings for RA patients with inadequate response to previous DMARD therapy.

PMS34

COST-EFFECTIVENESS OF GOLIMUMAB IN PSORIATIC ARTHRITIS FROM THE UK PAYER PERSPECTIVE

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BACKGROUND: Golimumab is a novel TNF-α inhibitor licensed to treat patients with active PsA. Although its clinical efficacy has been proven in clinical trials, its cost-effectiveness is yet to be established. **OBJECTIVES:** To estimate the cost-effectiveness of golimumab among patients with active PsA from the UK NHS perspective. **METHODS:** A decision analytic model was used to simulate progression of a hypothetical cohort of active PsA patients on golimumab and other TNF-α inhibitors as well as palliative care. The clinical evidence was derived from clinical trials of TNF-α inhibitors and compared using mixed treatment models. The primary outcome measure was quality adjusted life-years (QALYs) estimated based on change in Health Assessment Questionnaire (HAQ) and Psoriasis Area Severity Index (PASI) from baseline. The annual acquisition cost of golimumab was assumed to be identical to annual cost of other subcutaneous TNF-α inhibitors. The resource use costs and outcomes were discounted at 3.5% over a period of 40 years. The uncertainty surrounding important variables was further explored using probabilistic sensitivity analyses (PSA). **RESULTS:** TNF-α inhibitors were significantly superior to palliative care but comparable to each other on Psoriatic Arthritis Response Criteria (PsARC), HAQ and PASI response. The incremental cost-effectiveness ratio (ICERs) for golimumab compared to palliative care was £16,811 for PsA patients and £16,245 for a subgroup of PsA patients with significant psoriasis. At an acceptability threshold of £30,000 per QALY, the probability of golimumab being cost-effective is 89%. **CONCLUSIONS:** Once monthly, golimumab is a cost-effective treatment alternative for patients with active PsA. With its patient focussed attributes, golimumab is likely to offer additional choice in PsA treatment.

PMS35

COST-EFFECTIVENESS OF TERIPARATIDE IN PATIENTS WITH GLUCOCORTICOID-INDUCED OSTEOPOROSIS IN SWEDEN

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OBJECTIVES: Glucocorticoid induced osteoporosis is the most common cause of secondary osteoporosis. The objective of this study was to estimate the cost-effectiveness of teriparatide in patients with Glucocorticoid induced osteoporosis in Sweden. **METHODS:** A cost-effectiveness analysis was developed to evaluate the direct medical and tertiary care costs and clinical outcomes of an 18-month regimen of daily teriparatide in patients with glucocorticoid induced osteoporosis (GIO). a Monte Carlo simulation was used to model the cost and effects of a simulated cohort of 100,000 patients with GIO treated with teriparatide compared to no teriparatide treatment. The model simulated the course of events in 6-month cycles in individual patients over a lifetime horizon. During each cycle the patients were at risk of experiencing clinical

vertebral, hip and wrist fracture or death (either natural or excess mortality due to fracture). Swedish data on fracture costs, utility reductions after fracture, fracture risks and mortality rates were used. Uncertainty was investigated using one-way and probabilistic sensitivity analyses. Costs and utilities were discounted at annual discount rates of 3%. **RESULTS:** The analyzed cohort comprised patients aged 69 years (80% female) with a BMD T-Score of –2.5 SD and an historical vertebral fracture (5 years previous) and an incident vertebral fracture. In the base-case analysis of this cohort the costs in the teriparatide treatment group were 558,918 SEK per patient compared to 552,026 SEK in the no teriparatide group. The cost per QALY gained of teriparatide compared to no teriparatide was estimated to be SEK 25,000. The results were robust under a wide range of assumptions. **CONCLUSIONS:** For the analyzed cohorts, the base-case and one-way sensitivity analyses performed indicate that an 18-month teriparatide regimen versus no treatment in patients with glucocorticoid induced osteoporosis is cost-effective from the perspective of the Swedish payer.

PMS36

COST-EFFECTIVENESS OF TOCILIZUMAB FOR THE MANAGEMENT OF PATIENTS WITH ACTIVE RHEUMATOID ARTHRITIS DESPITE PREVIOUS DMARD THERAPY IN COSTA RICA

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OBJECTIVES: Rheumatoid arthritis (RA) is a chronic, progressive, inflammatory disease that affects physical functioning and quality-of-life and is associated with premature mortality and substantial economic burden. We aimed to assess the cost-effectiveness of tocilizumab added to disease-modifying antirheumatic drugs (DMARD) in patients with active RA despite DMARD therapy from the perspective of public health care system in Costa Rica. **METHODS:** A decision analysis was carried out to compare tocilizumab 8 mg/kg given every 4 weeks; infliximab 3 mg/kg (weeks 0, 2, 6, 14) and 5 mg/kg (every 8 weeks from week 22); etanercept 25 mg given twice a week and adalimumab 40 mg given every other week. The model included acquisition costs of biological agents during first year of treatment besides infusion-related costs for infliximab and tocilizumab. Indirect comparison techniques were needed to adjust American College of Rheumatology (ACR) responses rates found in 10 placebo-controlled clinical trials with biological agents used as add-on therapy to DMARD. ACR70 response rate, which can be regarded as a close measure of remission, was selected as primary efficacy outcome. Unitary costs were gathered from the 2010 Official Price List of the Public Health Care System in Costa Rica. All costs are expressed in 2010 US dollars. **RESULTS:** First-year costs for an average 70 kg weight patient were lower with tocilizumab (US$12,272) than with etanercept (US$13,000), adalimumab (US$13,650) and infliximab (US$14,340). Adjusted ACR70 response rate was higher for tocilizumab (26%) than for adalimumab (19%), etanercept (18%) and infliximab (12%). Incremental cost per patient achieving an ACR70 response with tocilizumab instead of anti-tumor necrosis factor (TNF) agents were estimated at –US$9,100, –US$14,771 and –US$19,686 for etanercept, adalimumab and infliximab, respectively. **CONCLUSIONS:** When used instead of anti-TNF agents, add-on treatment with tocilizumab brings both health benefits and cost-savings for RA patients with inadequate response to previous DMARD therapy.

PMS37

THE COST-EFFECTIVENESS OF ABATACEPT IN COMBINATION WITH METHOTREXATE FOR THE TREATMENT OF PATIENT WITH ACTIVE RHEUMATOID ARTHRITIS AFTER AN INADEQUATE RESPONSE TO METHOTREXATE IN THE UNITED KINGDOM

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OBJECTIVES: Abatacept in combination with MTX has recently been granted a positive opinion from the European Medicines Agency for use for the treatment of moderate to severe active rheumatoid arthritis in adult patients who responded inadequately to previous therapy with one or more conventional disease-modifying antirheumatic drugs (cDMARDs) including methotrexate (MTX). This analysis explores the cost-effectiveness of abatacept in this new indication. **METHODS:** A patient-simulation treatment-sequence economic model was constructed to estimate the incremental cost per quality adjusted life-year (QALY) for patients with RA in the United Kingdom. Abatacept with MTX , followed by a sequence of DMARDs was compared against a sequence of cDMARDs. Treatment-specific efficacy in terms of Health Assessment Questionnaire (HAQ) was used to calculate the patient's utility medical resource use and cost over a lifetime. Mortality was HAQ dependent. The analysis is performed from a National Health Service. Costs and outcomes were discounted at 3.5% each. **RESULTS:** Abatacept with MTX was estimated to yield 1.09 QALYs per patient (6.42 vs. 5.33) over lifetime, compared to DMARDs. The total lifetime costs associated with abatacept with MTX were £110,094 and total costs for cDMARDs were £79,933 resulting in an incremental cost-effectiveness ratio (ICER) of £27,657 per QALY gained. Sensitivity analysis confirmed the robustness of the model findings. **CONCLUSIONS:** This study has demonstrated that abatacept with MTX is a cost-effective treatment option compared to cDMARDs for patients with rheumatoid arthritis after an inadequate response to MTX.

PMS38

COST-EFFECTIVENESS OF RITUXIMAB VERSUS ALTERNATIVE ANTI-TUMOR NECROSIS FACTOR (TNF) THERAPY AFTER PREVIOUS FAILURE OF ONE ANTI-TNF AGENT FOR TREATMENT OF RHEUMATOID ARTHRITIS IN MEXICO

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OBJECTIVES: About 30% of patients treated with an anti-TNF agent failed to achieve an improvement of 20% in American College of Rheumatology (ACR) response. Recent clinical practice guidelines recommend the use of rituximab after previous failure of one anti-TNF. This study aims to assess the cost-effectiveness of rituximab compared to cycling between anti-TNF agents in this population from the perspective of the public health care system in Mexico. **METHODS:** A decision analysis was carried out to compare 2 rituximab courses (1 course, consisting of 2 infusions of 1 g each) given 6 months apart; infliximab 3 mg/kg (weeks 0, 2, 6, 14) and 5 mg/kg (weeks 22, 30, 38 and 46); etanercept 25 mg twice a week and adalimumab 40 mg every other week. Only direct medical costs cumulated during a one-year timeframe were accounted for and these included acquisition cost of biologic drugs besides infusion costs for rituximab and infliximab. Primary efficacy outcome was defined as an improvement of 70% in ACR response (ACR70), which is a close measure of remission. Indirect comparison techniques were used to adjust ACR responses rates found in 9 clinical trials. Number needed to treat (NNT) to obtain an ACR70 was then calculated. All costs are reported in 2009 US dollars (USD). **RESULTS:** For a 70 Kg patient, annual mean costs were estimated at USD$13,025 for rituximab, USD$12,938 for infliximab, USD$12,226 for adalimumab and USD$10,850 for etanercept. Adjusted ACR70 rates were higher in rituximab (12.4%) than in adalimumab (9.0%), etanercept (8.2%) and infliximab (5.4%). Average cost to achieve an ACR70 was lower with rituximab (USD$105,047) than with anti-TNF therapies, leading to savings of USD$27,270; USD$30,797 and USD$134,543 compared to etanercept, adalimumab and infliximab, respectively. **CONCLUSIONS:** This study suggests that rituximab treatment after previous failure of one anti-TNF agent is a cost-effective strategy compared to cycling between anti-TNF agents.

PMS39

COST-EFFECTIVENESS OF RITUXIMAB VERSUS ALTERNATIVE ANTI-TUMOR NECROSIS FACTOR (TNF) THERAPY AFTER PREVIOUS FAILURE OF ONE ANTI-TNF AGENT FOR TREATMENT OF RHEUMATOID ARTHRITIS IN COSTA RICA

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OBJECTIVES: About 30% of patients treated with an anti-TNF agent failed to achieve an improvement of 20% in American College of Rheumatology (ACR) response. Recent clinical practice guidelines recommend the use of rituximab after previous failure of one anti-TNF. This study aims to assess the cost-effectiveness of rituximab compared to cycling between anti-TNF agents in this population from the perspective of public health care system in Costa Rica. **METHODS:** A decision analysis was carried out to compare 2 rituximab courses (1 course, consisting of 2 infusions of 1 g each) given 6 months apart; infliximab 3 mg/kg (weeks 0, 2, 6, 14) and 5 mg/kg (weeks 22, 30, 38 and 46); etanercept 25 mg twice a week and adalimumab 40 mg every other week. Only direct medical costs cumulated during a one-year timeframe were accounted for and these included acquisition cost of biologic drugs besides infusion costs for rituximab and infliximab. Primary efficacy outcome was defined as an improvement of 70% in ACR response (ACR70), which is a close measure of remission. Indirect comparison techniques were used to adjust ACR responses rates found in 9 clinical trials. Number needed to treat (NNT) to obtain an ACR70 was then calculated. All costs are reported in 2009 US dollars (USD). **RESULTS:** For a 70 Kg patient, annual mean costs were estimated at US$15,040 for rituximab, US$14,340 for infliximab, US$13,650 for adalimumab, and US$13,000 for etanercept. Adjusted ACR70 rates were higher in rituximab (12.4%) than in adalimumab (9.0%), etanercept (8.2%) and infliximab (5.4%). Average cost to achieve an ACR70 was lower with rituximab (US$121,290) than with anti-TNF therapies, leading to savings of US$30,377; US$37,247; and US$144,266 compared to etanercept, adalimumab and infliximab, respectively. **CONCLUSIONS:** This study suggests that rituximab treatment after previous failure of one anti-TNF agent is a cost-effective strategy compared to cycling between anti-TNF agents.

PMS40

COST-EFFECTIVENESS OF DENOSUMAB COMPARED WITH GENERIC ALENDRONATE IN THE TREATMENT OF POSTMENOPAUSAL OSTEOPOROTIC WOMEN

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OBJECTIVES: Denosumab represents a new therapeutic opportunity for the treatment of osteoporosis, that received a positive opinion from the European Committee for Medical Products for Human Use in December 2009. This study aims to evaluate the cost-effectiveness of denosumab compared with the most relevant alternative (i.e. generic alendronate) in the treatment of postmenopausal osteoporotic women. **METHODS:** The cost-effectiveness of treatment for 3-years with denosumab was compared with generic alendronate using an updated version of a previously validated Markov microsimulation model (Value Health 2009:12:687–96). The model was